ABSTRACT OF DISCLOSURE

A device such as an electric motor, an electric generator, or a regenerative electric motor includes at least one stator arrangement having a plurality of electromagnetic assemblies with each electromagnetic assembly including at least a portion of a magnetic core that is formed from thin film soft magnetic material. The electromagnetic assemblies define a plurality of stator poles. The device also includes at least one rotor arrangement supported for rotation about a given rotational axis at a certain range of normal operating rotational speeds. The rotor arrangement has a plurality of rotor poles for magnetically interacting with the stator poles. The rotor poles are supported for rotation about the rotational axis along a circular path. A switching arrangement for controlling the electromagnetic assemblies is configured such that the switching arrangement is able to cause the stator poles of the electromagnetic assemblies to magnetically interact with the rotor poles of the rotor arrangement within a certain range of frequencies. The number of rotor poles is selected to be a number such that the switching arrangement causes the stator poles of the electromagnetic assemblies to magnetically interact with the rotor poles of the rotor arrangement in a way which causes the ratio of the frequency of the device in cycles per second relative to the revolutions per minute of the device to be greater than 1 to 4 during the operation of the device.